Interagency Ecological Program 2023 Work Plan Element
Estimation of Pelagic Fish Population Sizes

Project Manager and Affiliation

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Annual Costs (thousands) and Funding Sources

In-kind time of collaborators

Figure: *Crew members collecting data used for abundance estimation.*

Description

The goal of this program element is to develop abundance estimates for fish populations as a tool to support status assessment and management decisions. One element of this work focuses on developing model-based abundance estimates for multiple life stages of fish using data from historical surveys. The model-based procedure incorporates catch standardization with respect to environmental covariates that have the potential to affect fish availability to, and catchability by, a given gear. Another element of this work focuses on developing methods of estimating abundance using data collected by the Enhanced Delta Smelt Monitoring (EDSM) program. A final element of this work involves maintaining and updating design-based estimates of abundance that were developed previously using CDFW fish survey data and responding to inquiries related to these estimates. For the 2023 Work Plan, this program element will focus on Delta Smelt and Longfin Smelt.

Need

Estimates of fish abundance, and corresponding measures of uncertainty, are critical for assessing the status of the population, estimating vital rates such as survival and reproduction, assessing the effects of population supplementation strategies, and developing management actions aimed at population recovery and sustainability. The abundance estimates developed as part of this project serve as input data for life cycle models that are used to estimate vital rates and assess the effectiveness of management actions on the population dynamics and the likelihood of recovery. Methods of calculating abundance estimates and uncertainties for EDSM are needed to improve real-time reporting on the population size and population dynamics.

Objectives

- Develop and apply design-based and model-based, catch-standardized approaches to estimating abundance for different life stages of Delta Smelt using IEP fish survey data.
- Improve abundance estimation methods for data collected by EDSM.
- Attach measures of uncertainty to the abundance estimates.
- Extend methods developed for estimating Delta Smelt abundance to estimate Longfin Smelt abundance, accounting for their longer life span and varied geographic range.

Schedule of Milestones

Throughout 2023: The results of this program element will be provided to management and permitting staff, used in technical reports, manuscripts, and life cycle modeling efforts.